

NOTES ON THE COLOURATION AND HABITS OF
THE WHITE-BROWED GIBBON OR HOOLOCK
(*HYLOBATES HOOLOCK* Harl.).

BY

CHARLES McCANN, F.L.S.

(Assistant Curator, Bombay Natural History Society.)

(With 2 plates).

In January 1930, I was sent on special duty to collect material for a Gibbon group, on behalf of the American Museum of Natural History, New York. The Naga Hills were selected as a suitable venue for the expedition. An artist, a modeller and myself composed the members of the expedition. Our camp was situated at a place called Changchang Pani (*Changchang Tsu*), twelve miles from Nakachari Railway Station. Changchang Pani is situated at an elevation of 500 ft. above sea level, with the hills of Lakhuni rising to about 2,000 ft., near by. It is on the 'high road' between Nakachari and Mokakchang, and is the halting place for the Nagas on their way to and from their *busties* in the interior. The hills are covered with dense evergreen forest with barely any footpaths through them. In consequence, one's movements are restricted to the watercourses. Bamboo is the predominant species—a species with a very hollow stem.

This expedition offered me a splendid opportunity for observing the White-browed Gibbon in its natural environment. At Changchang Pani I spent nearly two months doing little else but observing these animals. The forests were literally teeming with gibbons, which could be heard on all sides. But owing to the dense nature of the jungle, they were not always easy to get at. By careful stalking, I was successful in obtaining the specimens required and also in observing their habits. The gibbons were not always very shy, but owing to constant persecution by some of the Nagas for food, they were rather suspicious of one's movements. I spent much time with glasses and gun trying to study their ways. My observations, which I detail below, it will be observed, are not always in agreement with the observations of other naturalists. It is possible that many recorded observations of the habits of these animals have arisen from statements made by natives. Long experience has convinced me, if conviction is necessary, that statements of natives are frequently wrong. Not that the folk tell the story with the idea of deceiving, but they often let their imagination and superstitious beliefs obscure the true facts. The story is usually based on certain facts which need careful analysis, and this is pardonable in ignorant folk. How much more aggravating is it to listen to educated people who in all seriousness glory in narrating stories after the manner of 'Col. Longbow'.

It has been generally understood that *both* the males and the females of this gibbon vary in colour from brownish-black to yellowish-grey. As far as my observations go this change of colour, if we exclude the change undergone by the newly-born young, is limited to the female sex.

It has been generally understood that both the males and the females of the Hoolock vary in colour from black to yellowish grey.¹ My observations, however, are not in accord with the generally accepted statement. I am of opinion that the change of colour is restricted to the adult female.

The young of this gibbon at birth is a pale greyish-white with a yellowish tinge. The face, the palms of the hands, the soles of the feet are black. As growth proceeds the coat becomes darker and darker, usually with lighter patches around the rump, but finally it gets quite black. Both sexes pass through this change with this important difference. The dark colouring, deepening with age to glossy black, is retained by the *males through life*: in the case of the female a *second change* is undergone when she reaches puberty. Her black fur fades gradually to the light yellowish brown phase referred to frequently by various authors.

The change from the greyish-white of the new-born gibbon to the dark colouring exhibited in the juvenile stage makes it particularly difficult to see whether a female has a young one at her breast or not. Though the dorsal fur of the mother is pale the brown skin of her ventral surface, sparsely clad with hair, harmonises with the dusky colouring of the baby gibbon at her breast.

Of all the gibbons that I shot (and I shot nearly thirty including males, females, and young of all ages) I never secured a *black* female with young, nor did I see a single *black* female with young among the numerous parties that I observed. Among the specimens that I secured, there was a single female which showed a partial change of colour in her coat. Judging from this specimen, it appears that the limbs change colour in advance of the body, particularly around the hindquarters. However, this may vary with different individuals. There is no sign of moult at this period but a gradual canescence of the hair. In all cases I examined the ovaries and uteri of the females with the black coat and in every case was sure that they had never at any time given birth, not even the one that was undergoing the change of colour. The Nagas hold the same view, viz., that the females are always lighter in colour than the males. This change of colour may possibly amount to a secondary sexual character indicating that the animals have reached maturity.

In the *Fauna of British India*, Blanford writes:—"Many individuals, however, both males and females, vary in colour from brownish-black to yellowish-grey, the frontal band being always conspicuously paler." And further on, "Blyth thought that the males only were black, the females always paler; but this is certainly not the case, the females, however, are more frequently

¹ Blanford, 1888. *Fauna of British India* (Mammals), p. 6,

pale-coloured than the males''. Blanford's contradiction of Blyth's opinion is so far correct, that the young females are black until the time they reach maturity when the change takes place. But to say that the females 'are more frequently pale-coloured than the males' is, as far my observations go, certainly not the case, for all mature females are pale.

Pocock¹ in a note on the Hainan Gibbon writes as follows:—"I am informed by Mr. de St. Croix that the young of both sexes of this species are alleged by the natives to be lighter-coloured at birth and for a short time afterwards than their parents. His animal (Pocock refers to a specimen deposited by de St. Croix at the Zoological Society's Gardens) when purchased, was a dark smoky grey, which, however, soon turned black; and perfectly black she remained all the years she was in his possession. But in a few weeks of being brought to the Gardens she began to go grey, Mr. de St. Croix himself noticing a decided alteration in this respect when he visited her on March 8th., about six weeks after her arrival in London. During the spring and early summer the grey-ness progressed rapidly, but not quite uniformly all over the body. In midsummer, according to my notes, the head was black with a grey band extending on each side of the eyebrow over the ears; the beard was whitish and the nape of the neck blackish; the greater part of the body was blackish-grey, with a considerable quantity of blackish hairs on the sides of the belly close to the thigh and a broad triangular black patch narrower posteriorly, extending from the collar-bones on the fore part of the belly and bordered on each side by a grey area paler in tone than the back; the thigh and upper arm were paler than the distal portion of the limbs. By this time she was not recognisable as the same animal that reached the Gardens in January. Still the greyness continued to spread, the black pigment died out from the areas mentioned above, lasting longest upon the chest and the crown of the head. At this period she presented a decided similarity to the left-hand figure on the plate depicting *H. pileatus* Gray (*P.Z.S.* 1861, p. 136, pl. xxi), although the black pectoral area was smaller and the patch on the crown less sharply defined at the edges. In the early autumn she was a stone or silvery grey practically all over except for a blackish median band, fading away laterally and posteriorly, down the middle line of the head.'

Pocock goes on to describe the change as it comes about and then writes:—" . . . But, so far as I am aware, it was not previously known that a given individual after reaching maturity may change colour in the way exemplified by Mr. de St. Croix's specimen." This I am convinced is really what takes place in the female of the Hoolock and I do not hold any doubts on the subject. Further Pocock asks the question: "Is this canescence then a matter of sex and exhibited only by the mature females?" and goes on to say, "The balance of the evidence seems to be on the

¹Pocock, 1905. Observations upon a female specimen of the Hainan Gibbon (*Hylobates hainanus*), now living in the Society's Gardens. *P.Z.S.*, Lond., vol. ii, p. 172.

whole in favour of an affirmative reply to the question. For, apart from the changes here recorded of the only adult female known, it must be remembered that Mr. Swinhoe, in his published account of the information respecting the Hainan Gibbon he was able to gather, quotes from the Chinese Gazetteer of the Kiung Shan district of the island a passage stating that the male is black and the female white (*P.Z.S.* 1870, p. 244, etc.)."

Here we have a parallel case to that which I have just recorded with reference to the Hoolock. A young female which I secured alive in February (1930), which was about a month old at the time of her capture, was a dusky colour when I first got her, but since then till the time of her death, in November 1931, she gradually got darker and darker till she was almost quite black.

Now we may as well ask why it is that so many have stumbled into this error? There is probably only one answer to this question, and that is, that they were unable to correctly determine the sex of the specimens in hand, or were satisfied with a superficial examination. But still further, the change of colour that takes place when the females reach maturity was not known to them. I must confess here that I fell into the same pit with the first two or three specimens of immature females. The reason for this is not far to seek—it is extremely difficult to sex this gibbon from a superficial examination as the females possess a peniform clitoris, which is almost as long as the penis of the male. Both the organs (penis and clitoris) are very similar in appearance. Zuckerman in a paper on *The Menstrual Cycle of Primates* (*P.Z.S.* 1930, pt. iii, p. 699) refers to this point in the following words:—"It might be noted in passing that there is less sexual dimorphism in the *Hylobatidae* than in any other primate family. Field workers, and even systematic zoologists, frequently experience difficulty in distinguishing the two sexes. The lack of cyclical variation in perineal form adds greatly to this difficulty."

In a subsequent paper on the Gibbons of the genus *Hylobates* (*P.Z.S.* 1927, p. 719.), Mr. Pocock giving the characters of *Hylobates concolor*, described previously under the name (*hainanus*) states that one of its distinguishing features is "the presence in the female of a long clitoris, grooved below, which depends beneath the vulva simulating the penis of the male".

Hylobates concolor was originally described by Harlan (*Journ. Acad. Nat. Sci. Philad.*, v. pt. 2, p. 231, pls. ix and x, 1837) from Borneo, and Mr. Pocock in referring to this species in the paper doubts its origin from this Island. He writes 'from the positive evidence supplied by the colour and by the *structure of the clitoris* the conclusion seems unavoidable that the specimen to which the name *concolor* was given came from Hainan or the adjoining mainland Tonkin and not from Borneo'.

Now from the observations I have made in regard to the structure of the clitoris in the Assam Gibbon which is apparently the same as in the Hainan species—*H. concolor* might equally have come from Assam—it is obvious that this particular character is of no value for purposes of differentiation between the species.

In this connection it might be of interest to add Pocock's remarks under the subtitle of *Determination of the Sex* in the paper already referred to above, on the Hainan Gibbon. He writes:—"When Mr. de St. Croix brought the specimen to the Gardens he informed me that she was a castrated male; and in support of his opinion drew my attention to the large size of the clitoris, which he most naturally mistook for the penis. The naked and turgid labia of the vulva he regarded as the unhealed wound caused by castration; and the menstrual discharge which first appeared in December of 1903, when the Ape was on her way to England, he attributed to normal bleeding induced by enforced sitting on the hard floor of her travelling box. He also told me that it was commonly believed in Hainan that female specimens of the Gibbon are never brought to the coast and are practically unobtainable.

"There can be no doubt that this belief, coupled with the peniform clitoris of the Gibbon, misled Mr. de St. Croix as to the true sex of his animal, the castration of which, he admitted, he had not himself witnessed. And it seems probable that the belief itself is traceable to the repeated mistakes on the part of Europeans in determining females as castrated males on account of the length of the clitoris in these Apes as compared with the same organs in the Monkeys of the Old World, generally. In this connection it is interesting to recall the fact that Dr. Harlan, after the dissection of the genital organs, described his specimen of *Hylobates concolor* as 'an hermaphrodite Orang Outan'. It appears to me, however, that Lesson's criticism of this opinion was perfectly justifiable and his decision that the specimen was an immature female undoubtedly correct. Pousargues, also, who did not know Lesson's paper, came independently to the same conclusion, and stated in the type of *Hylobates nasutus*, a young female, the clitoris was well developed and grooved below; and that the animal resembled in every particular, so far as the generative organs were concerned, the Gibbon determined as hermaphrodite by Harlan. And since Harlan and two other doctors, presumably acquainted with human anatomy, who assisted at the dissection, were decided as to the true sex of the specimen, in spite of the best possible opportunities for investigation, it is no wonder that Europeans living in Hainan fall into a similar mistake.

"So far as can be seen, the clitoris of the Hainan Gibbon is like that of the specimen figured and described by Harlan, which resembles the penis of a primate in a state of hypospadias. A comparatively slight modification would convert such an organ into a closed tube for the passage of urine—a fact perhaps of some significance in connection with the low position of the Gibbons in the Anthropomorphous series, seeing that in the Lemurs, the lowest existing Primates, the clitoris is traversed by the urethral canal."

Up to the present we have been dealing with the mistaken sex identity of the female, but what of the sexual characters of the male? In the male there is no distinct scrotal sac which is such

a prominent character of most male monkeys, particularly the Macaques. The testes are situated rather high up, almost in the groins. The genital organs are hidden from view by a tuft of long preputial hairs which completely conceal the greater part of the penis. Both the clitoris and penis are very similar in appearance, except for the fact that the penis forms a closed tube while the clitoris is open along its length on the ventral surface. In both cases the organs are directed obliquely backwards. In the male the penis protrudes a little beyond the tuft of preputial hairs, thus preventing the animal wetting its fur when urinating. This tuft of hairs is not very evident in the young males, probably being developed later in life. The preputial hairs though generally black are frequently mixed with grey hairs. The penis is little in excess of the clitoris in length and it is on account of the close resemblance of the two organs that the determining of the sex forms a stumbling block for the unwary. This really explains why so many have erred in connection with the colouring of these animals.

Pocock, writing on the Gibbons of the genus *Hylobates*, makes the following remarks:—"Judging from the material at his disposal, Blyth thought that the two colour-phases of *H. hoolock* were sexual, the males being black and the females brown. This view was quite correctly disputed by Blanford, but was revived by Elliot in 1913. It is nevertheless approximately true. All the male specimens I have seen exhibited the black phase and all the females, except one, the pale phase. This exceptional female, which the collector erroneously sexed as a male, came from H'Kamti in Upper Chindwin. She is black, faintly tinged with brown, and has some greyish hairs on the sides of the face and a dirty white patch behind the chin."

Pocock states that all the black specimens he had before him were males with the exception cited above, and that all the females were pale coloured. Is it not possible that among the specimens that showed the black 'phase', there were one or two examples of juvenile females wrongly sexed by the collector? Surely, the collector did not obtain exclusively *mature* males and *mature* females out of the number he collected! It appears that Pocock was led to re-examine the sex of the 'exceptional female' only because it showed the changing phase and on this account was not prepared to accept the sexing of the collector. It would be interesting to know whether Pocock also checked the sex of each of the specimens showing the black phase, or accepted the sexing of the collector. I have already indicated the difficulty of recognising the sexes in the cases of freshly killed males and females. If the collector made a mistake with the sexing of this individual, is it not possible that he also wrongly sexed some of the others?

In my opinion this gibbon has a definite breeding season which is during the cold weather. Almost every mature female I came across between January and early March was with a baby, clearly indicating that the maximum birth rate is during the cold season. The young appear to be born between November and February.

As indicated above, the young when born is almost white with a yellowish tinge. As far as I was able to observe, it clings to its mother always with one teat of the parent in the mouth, even when she is swinging about in the branches. When born, the young is without teeth, but soon after it gets a full complement of 24 milk-teeth. The second set of teeth appears between the age of eight or nine months (this observation I conclude from the specimen that I had in captivity). The permanent teeth appear slowly and very irregularly—the incisors are the first to appear. My specimen was about a month old when I got her in February (1930). In September of the same year, the permanent teeth began to appear. At the time of her death in November, 1931, not all the permanent teeth had appeared.

The colour of the baby I had in captivity, when I first secured her was dusky, with lighter patches around the callosities. She gradually became darker and darker in tone. At the time of her death she was almost quite black, but still retained the lighter patches around the callosities. There were also a few light-coloured hairs in the beard. The white brows were very conspicuous—from birth this point is very prominent. The callosities are not very evident and are usually covered over by the surrounding hair. This condition also prevails with the adults.

With regard to their habits, Blanford (l.c.) writes:—“Like most other Gibbons the Hoolock is found associating in flocks, often comprising from fifty to a hundred individuals, or even more. An old male, however, is occasionally found solitary.” This is yet another point on which my observations differ. These apes are at the best of times difficult to see when they are in dense forests, and the din created by a party of them, which is soon taken up by another party near by, and so carried through the jungle, often does give one the impression that there is a very large number of them together. This was also my opinion when I first made their acquaintance when I was in Assam in 1918, but at that time I did not see many of them. Different parties will meet within reasonable distance without molesting one another, but this is no evidence that they all belong to the same party. I have found that the Hoolock goes about in small family parties, usually consisting of an adult male and female with young of different ages, the youngest sticking to the breast of the mother. The largest party I have observed consisted of seven individuals, an adult male and female and five young ones, the youngest of which was clinging to the mother's breast. Mackenzie, who collected specimens of this species for the Mammal Survey of India, writes, “It is generally found in parties of three or four, but I have seen single ones, and once a party of six.” (*J.B.N.H.S.*, xxiv, p. 762.) Wells notes:—“The Mishmis say that there are only three parties of these Gibbons, each about ten or twelve in number, in the Dening District.” (*J.B.N.H.S.*, xxxi, p. 385.) This statement is based on hearsay, but is more in accordance with the true habit of the animals than the statement by Blanford.

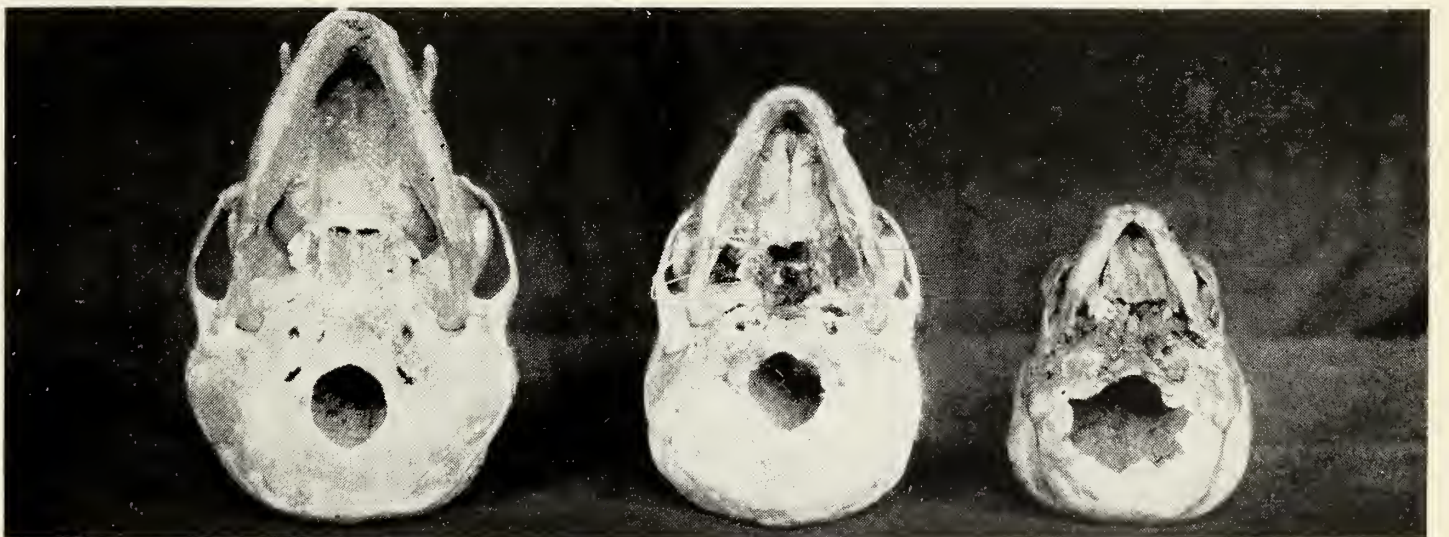
Zuckerman in his recent work entitled *The Social Life of Monkeys and Apes*, p. 23, writing in reference to the Lar Gibbon,

(*H. lar*) says, "The Lar Gibbon, one of the lesser apes, is unanimously reported to live in small family parties, while the Hoolock gibbon, is found only in large troops." Further on, p. 180, the same author quotes Kloss, "The statement that gibbons are monogamous is one that I thoroughly agree with: whether however they divorce each other and take new partners from time to time we have yet to learn. The point is interesting, since such an able reasoner as Westermarck has come to the conclusion that the marriages of mankind are an inheritance from some ape-like progenitor." I am also inclined to the belief that the Hoolock is monogamous. The reason for this belief is based on the fact that a pair of adults is always found together with their young of the present and preceding years, a single baby being born each year. It appears strange that so closely related gibbons should have such different social habits. It seems to be well established that the Lar Gibbon lives in family parties, and my own observations convince me that the Hoolock has also the same habit of living in family parties.

Frequently a male may be seen feeding alone, but somewhere in the offing the family is out of sight. On one occasion I came across a 'solitary' male feeding on the flowers of the Silk Cotton Tree (*Bombax malabaricum*), so I watched his movements unnoticed. After a short while he gave a low call which was soon followed by the appearance of a female and her young ones (two in number) and they also commenced feeding on the flowers. I watched them for some time, before the four of them fell victims to my gun. On another occasion I came across a solitary female, which was completely fawn coloured, but as I was in need of the mature females she was soon brought to bag. There were no others in the neighbourhood and of this I made certain. Judging from this case, it appears that when a female has reached maturity and has completely changed from the black to the fawn phase she is either driven out of the family or leaves it of her own accord in search of a mate; however, this point is open to question.

It appears to me that the family tie is exceptionally strong with these animals, which I conclude from the following facts. One day I came across a small party of three, consisting of one adult male, one partially grown young one and a baby about four (?) months old. I secured all of them. All were black and both the large ones were males. The baby was clinging to the older one as though it were its mother. The baby was a female. I searched the neighbourhood to see if there was a light-coloured female about, but without success. This incident goes to confirm the Naga belief that in the event of the death of the mother, the other members of the family help to look after the baby.

Judging from the number of individuals that go to compose a family, it appears that it must take four to five years or perhaps six years before this gibbon reaches maturity, and in the case of the females, turn light-coloured. After reaching maturity they probably leave the old family party or are turned out of it to fend for themselves.



Left: adult. *Centre:* 21 months old. *Right:* newly born.
Skulls of the Hoolock Gibbon (*Hylobates hoolock*, Harl.) showing the skulls
at different ages which clearly show the contours of the skulls
and the condition of the teeth at different ages.

Gibbons spend the greater part of the day in high trees, but not just the highest, except in the case of the trees, which afford them food. But during the hottest part of the day frequently descend into the low tiers of the jungle. During the early hours of the morning gibbons may frequently be seen sunning themselves on the exposed branches of trees. When alarmed, they take refuge in the bamboo clumps and use them as a means of getting away swiftly. They will also take refuge in the foliage at the tops of high trees or hide in the forks of thick branches peeping 'round the corner' when they do so. The speed at which they can cover long distances is surprising. The alarm call is a sharp short rather harsh bark, which may be repeated, but alarm may be expressed by quite another sound which may be likened to a loud belch, which is repeated from time to time.

At about 9 a.m. (local time) they commence their 'joyous' howling which is so characteristic of gibbons. This is kept up till a little before noon and then all is quiet till about four in the evening. In the evening the howling does not continue for long. The voice is very powerful and may be heard over long distances. To utter this (and every other vocal expression) the lips are used; the lips are brought round in almost the same shape as a person pronouncing an O with a pout. Each time the sound is made it is accompanied with a toss of the head. The call seems to sound like a long 'hooo-oo', by first expelling the breath and the same sound repeated by taking in the breath. In this way I was able to imitate the sound with a fair degree of accuracy. This cry is repeated several times in the same manner. The 'music' is commenced in a very high key by one of the party (possibly by one of the young ones) and is then taken up by the rest and repeated over and over again. Amid the 'altos', 'sopranos' and 'falsettos' is to be heard the deep bass of the male. The call is taken up by other parties in succession or in concert with the one that started it. Besides the sounds already described there are a number of other sounds which defy description. When eating, a Hoolock generally makes a belching sound after each mouthful, as though to express satisfaction. A whining noise is also made which is altered in tone to suit the occasion, which may mean displeasure, or is uttered when the animal is pleading for something. These sounds are produced by stretching the lips across the mouth as though it were trying to smile. When angry, the mouth is opened, baring all the teeth in true 'monkey fashion', at the same time staring hard at the object which gave rise to the anger. When irritated, they frequently strike out with their long arms instead of biting, but may also use their hands to pull the object nearer and then inflict a bite.

In the trees their mode of progression is by means of swinging from branch to branch, either with the hands alone, or with the hands and feet, though the former is the commoner practice. They are able to drop down considerable distances from one branch to another and are also capable of making prodigious leaps. But when on a thick bough they walk erect along the top of the branch using the arms as a means of balance and support. It is surprising to